The Pennsylvania System of School Assessment
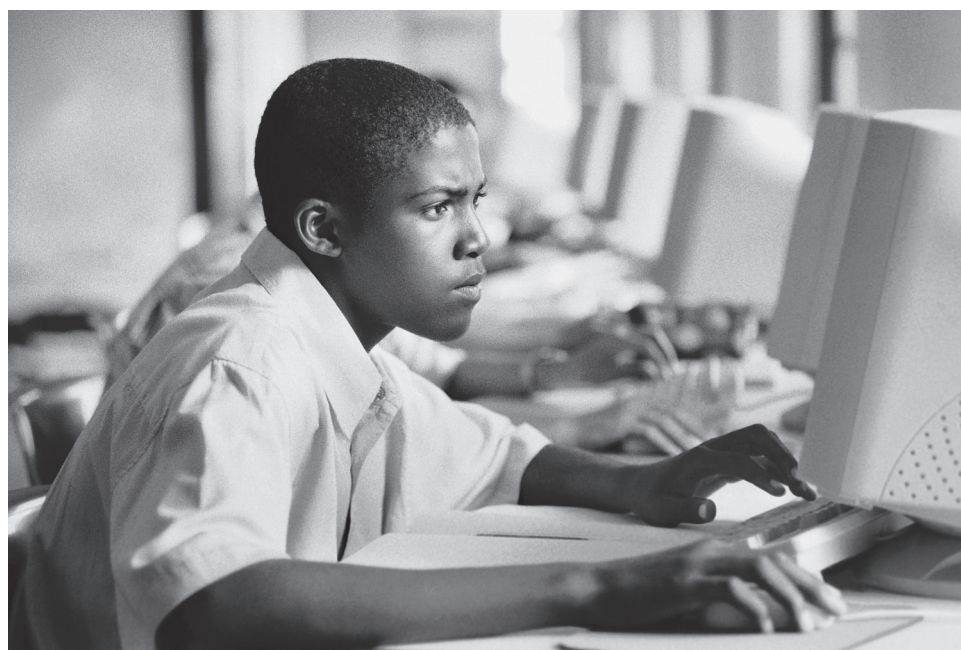
2006 – 2007
Mathematics Item and Scoring Sampler
Grade 7

MATHEMATICS

GRADE 7 MATHEMATICS MULTIPLE-CHOICE ITEMS

> **During an assessment, students would not be permitted to use a calculator on items 1–3.**

A.1.1.1

1. Liz had $\frac{7}{8}$ of a puzzle finished. What percent did she have finished?

   A   70% | *based on numerator* |

   B   87.5% *

   C   114.3% | *approximately 8 ÷ 7* |

   D   875% | *decimal placement error* |

A.3.2.1

2. Solve:

$$3\frac{5}{9} \div 2\frac{2}{3}$$

   A $\frac{17}{21}$ | $\frac{17}{9} \times \frac{3}{7}$ |

   B $1\frac{1}{3}$ *

   C $6\frac{2}{9}$ | *added* |

   D $9\frac{13}{27}$ | *multiplied* |

A.3.2.2

3. Solve:

$$56 - (^-42)$$

   A $^-98$ | $^-56 - 42$ |
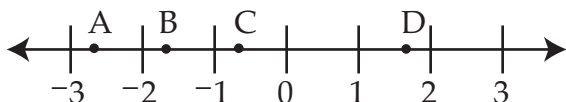
   B $^-14$ | $^-56 + 42$ |

   C   14 | $56 - 42$ |

   D   98 *

MATHEMATICS

A.1.2.3

4. Which point on the number line below is closest to $-1\frac{2}{3}$?

  A   point A

  B   point B *

  C   point C

  D   point D

A.2.1.1

5. Simplify:

$$(10 + 4) \div 2 + 32 \div 2^3$$

  A $4\frac{7}{8}$ *left to right; using 8 for 2^3*

  B $6\frac{1}{2}$ *left to right; 2^3 as 6*

  C   11 *

  D $12\frac{1}{3}$ *2^3 as 6*

A.2.2.5

6. Carlos bought 3 gallons of ice cream for $9.50. Which proportion can be used to find the cost of 7 gallons of ice cream?

  A $\frac{3}{7} = \frac{x}{9.5}$

  B $\frac{3}{9.5} = \frac{x}{7}$

  C $\frac{7}{9.5} = \frac{x}{3}$

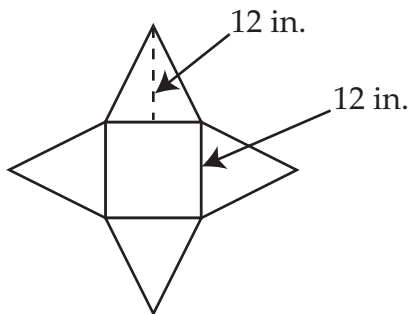 D $\frac{9.5}{3} = \frac{x}{7}$ *

MATHEMATICS

B.1.1.1

7. Mia put $2\frac{1}{2}$ gallons of milk in the refrigerator. How many pints of milk are equal to $2\frac{1}{2}$ gallons?

A $8\frac{1}{2}$ pints | 8 quarts = 2 gallons; plus $\frac{1}{2}$ |

B   10 pints | in quarts |

C $16\frac{1}{2}$ pints | 16 pints = 2 gallons; plus $\frac{1}{2}$ |

D   20 pints   *

B.2.1.1

8. Tamiko made a paper decoration as shown below. Each side of the square is 12 inches. Each triangle has a height of 12 inches.

What is the total area of the decoration?

A   144 sq in. | area of square |

B   288 sq in. | area of square + 2 triangles |

C   432 sq in.   *
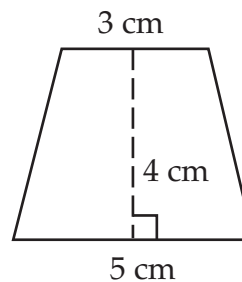
D   720 sq in. | area of square + 4(bh) |

B.2.1.2

9. The radius of Hattie's circular mirror is $5\frac{1}{4}$ inches. What is the approximate circumference of her mirror?

A   8.24 inches | $r \div 2 \times 3.14$ |

B   16.49 inches | $r \times 3.14$ |

C   32.97 inches   *

D   86.55 inches | $r^2 \times 3.14$ |

B.2.1.3

Use the shape below to answer question 10.

10. In square centimeters, what is the area of the shape?

A   6 | $\dfrac{(3 + 4 + 5)}{2}$ |

B   12 | $(3 + 4 + 5)$ |

C   16   *

D   30 | $2 \times 3 \times 5$ |

MATHEMATICS

B.2.3.1

11. An architect designed an 8-story apartment building that was to be 128 feet high. He made a model of the building using a scale of $\frac{3}{4}$ inch = 1 foot. How high was the model?
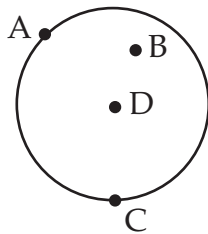
A   96 inches   *

B   171 inches

C   1,152 inches

D   1,536 inches

$128 \div \frac{3}{4}$
$\frac{3}{4}$ *feet = 9 inches;*   *9 × 128*
128 × 12 inches

C.1.1.1

12. Oscar wants to draw a chord on the circle shown below.

Where should he draw the line segment?
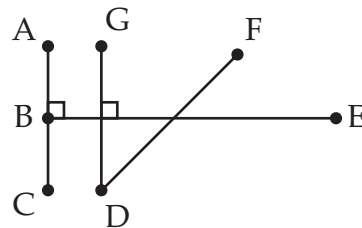
A   from point A to point C   *

B   from point B to point D

C   from point A to point B

D   from point D to point C

C.1.1.3

Use the figure below to answer question 13.

13. Which line segments in the figure are perpendicular?

A $\overline{AC}$ and $\overline{GD}$

B $\overline{GD}$ and $\overline{DF}$

C $\overline{DF}$ and $\overline{BE}$

D $\overline{BE}$ and $\overline{AC}$ *

C.1.2.1

14. Mr. Chang made 2 similar rectangular window frames. One frame was 12 feet wide and 16 feet long. What could be the dimensions of the other frame?

A   2 feet wide and 6 feet long

B   6 feet wide and 8 feet long   *

C   16 feet wide and 20 feet long
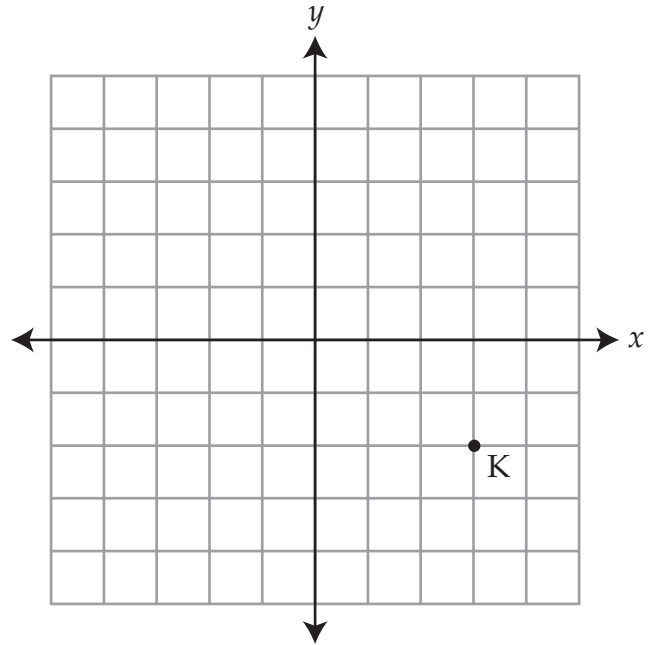
D   24 feet wide and 48 feet long

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C.1.2.2

15. Trapezoid QRST is congruent to trapezoid WXYZ. Which side corresponds to $\overline{TQ}$?

    A $\overline{XY}$

    B $\overline{YZ}$

    C $\overline{ZW}$ *

    D $\overline{WX}$

C.3.1.2

Use the coordinate plane below to answer question 16.

16. In which quadrant is point K located?

    A   quadrant I

    B   quadrant II

    C   quadrant III

    D   quadrant IV *

MATHEMATICS

D.1.1.1

17. Devonne created the following pattern.

    0.2   −0.6   1.8   −5.4   __?__

    The pattern continues. What is the next number in the pattern?

    A   −16.2   *wrong sign*

    B   −10.8   *multiply by 2*

    C   10.8   *multiply by −2*

    D   16.2 *

D.2.1.2

Use the expression below to answer question 18.

$$x^3 + 40 \div y - (10 + 3)$$

18. What is the value of the expression when $x = 4$ and $y = 8$?

    A   0 $104 \div 8 - 13$

    B   4 $12 + 5 - 13$

    C   56 *

    D   62 $64 + 5 - 10 + 3$

D.2.2.1

19. Kevin heard that the overnight temperature (t) would not rise above 32°F. Which statement represents the overnight temperature in °F?

    A $t \le 32$ *

    B $t < 32$

    C $t = 32$

    D $t \ge 32$

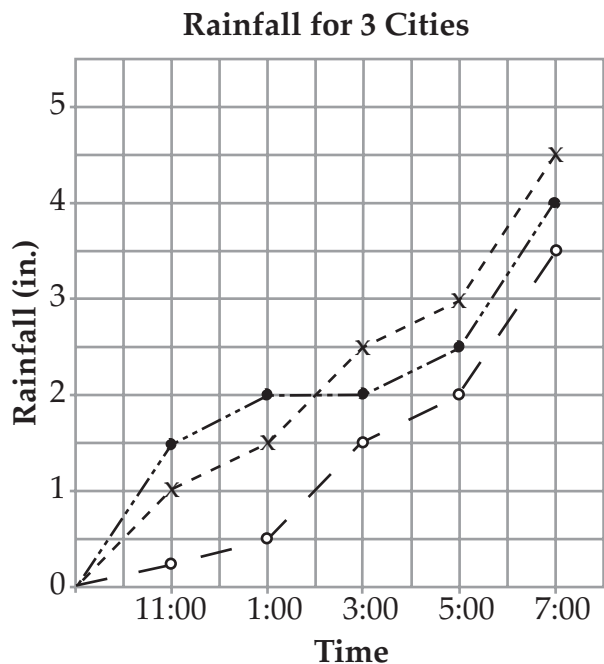## D.3.1.1

20. Li can type 170 words every 2 minutes. How many words should Li be able to type in 5 minutes?

    A   34 $\dfrac{170}{5}$

    B   85 $\dfrac{170}{2}$

    C   425 *

    D   850 170×5

MATHEMATICS

E.1.1.1

21. The rainfall for 3 cities is graphed below. At what time was the total of the rainfall for the 3 cities approximately 4 inches?

Rainfall for 3 Cities

Key	
City A	— —o
City B	---- x
City C	·—··— ●

A   1:00 *

B   3:00

C   5:00

D   7:00

E.2.2.1

22. The table below shows areas of several offices.

Areas of Offices

Office	Area (sq ft)
A	80
B	25
C	25
D	125
E	60
F	200
G	35
H	50

In square feet, what is the **median** area of the offices?

A   25   mode

B   55 *

C   75   mean

D   125   mid-table number

MATHEMATICS

E.3.1.1

23. A restaurant display case has the following tea bag selections.

Tea Bags

Flavor	Number
black tea	15
cinnamon	10
green tea	15
lemon	4
raspberry	6

What is the probability that a tea bag randomly selected from the case will be cinnamon?

A $\frac{1}{50}$ *1 bag in 50*

B $\frac{1}{10}$ *1 of 10 cinnamon*

C $\frac{1}{5}$ *

D $\frac{1}{4}$ *10 cinnamon/40 others*

E.3.1.3

24. Marbles were randomly drawn from a bag one by one. After each draw, the color was recorded, the marble was returned to the bag, and then the next marble was drawn. The results are recorded below.

Marbles

| Color	Number in Bag	Number Drawn
black	10	8
green	50	45
purple	5	2
red	20	25
yellow	15	20

What is the **experimental** probability that a marble randomly drawn from the bag will be red?

A $\frac{1}{25}$ *1 of 25 drawn*

B $\frac{1}{5}$ *theoretical probability*

C $\frac{1}{4}$ *

D $\frac{1}{3}$ *25 red drawn/others*

MATHEMATICS

E.4.1.1

25. A motel desk clerk made a graph to show the number of rooms occupied each day for 2 weeks starting Sunday, May 1.

Rooms Occupied
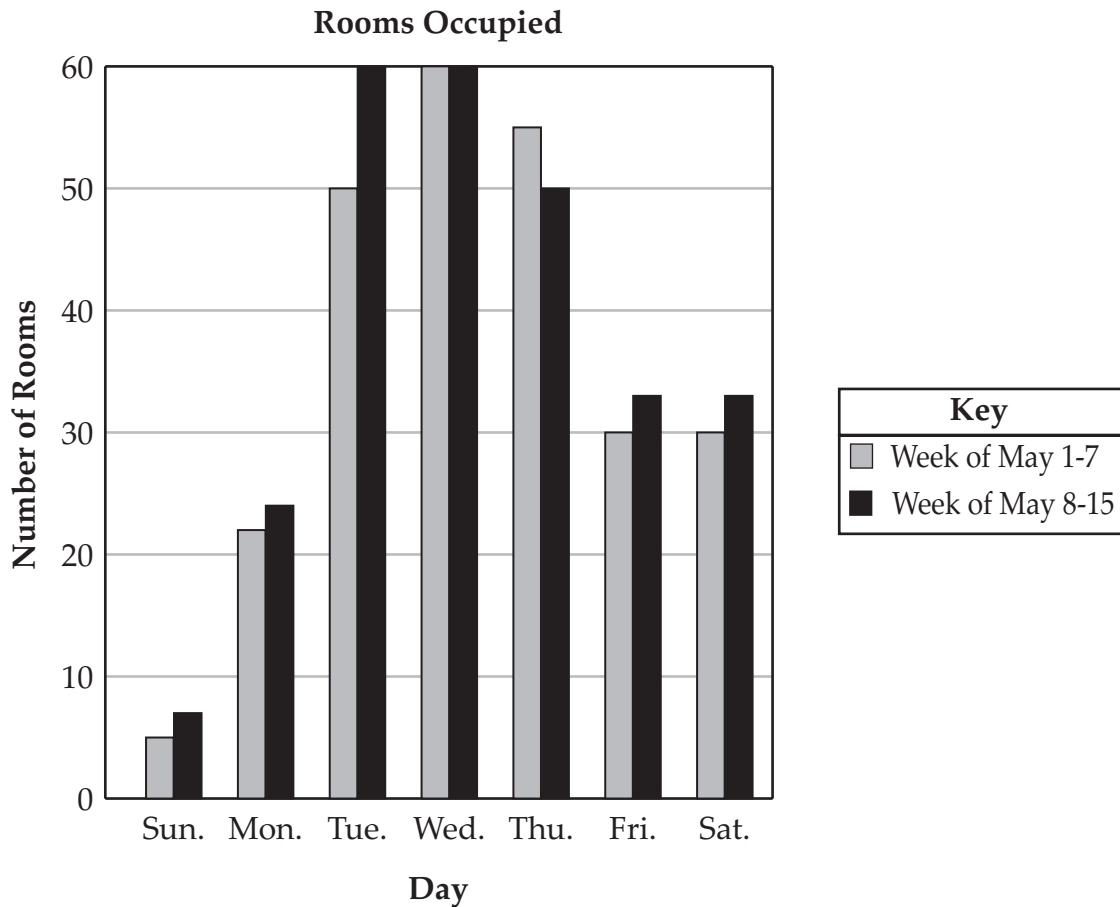
Based on the graph, which day had an occupancy of 55 rooms?
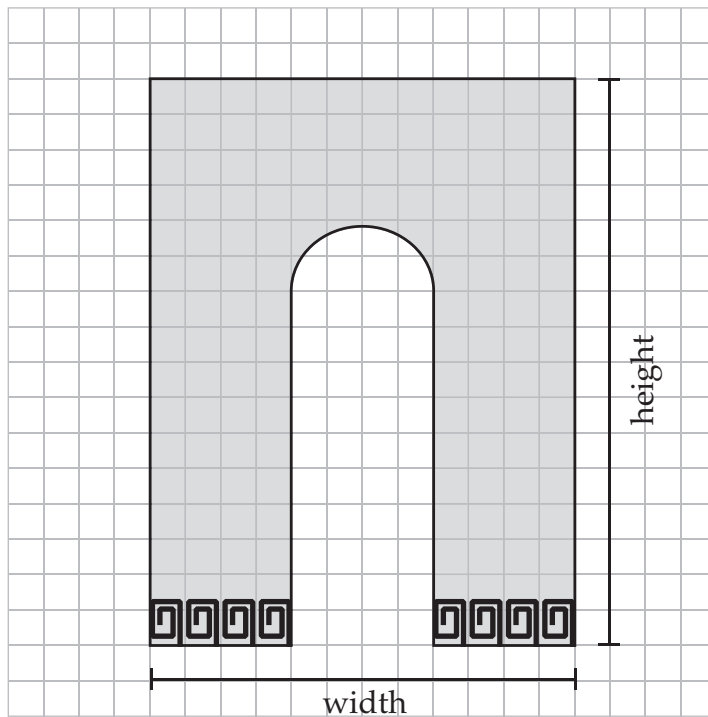
A   Tuesday, May 3

B   Thursday, May 5 *

C   Tuesday, May 10

D   Thursday, May 12

GRADE 7 FIRST OPEN-ENDED ITEM
B.2

26. An architect made a scale drawing on a grid of the front of an arch for a public park.

height

width

Scale
$\vdash\!\!\dashv = 4\frac{1}{2}$ feet

A. What will be the actual width and height, in feet, of the arch?
Show or explain all your work.

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

26. *Continued*. Please refer to the previous page for task explanation.

B. The architect wanted to make another scale drawing of the arch based on its actual height and width. The drawing of the arch had to measure 4 inches by 3 inches to fit on a card. What scale should the architect use for this drawing? Show or explain all your work.

C. The architect planned to enlarge the arch for a project in another city. The larger arch was to be $1\frac{1}{4}$ the size of the original. What will be the width and height, in feet, of the larger arch? Show or explain all your work.

GRADE 7 SECOND OPEN-ENDED ITEM
E.2

27. A new building contains 10 rental apartments. The apartments vary in size. The monthly rental charges for the apartments are shown in the table below.

Apartment Rental Charges

Apartment	Monthly Rent
A	$ 480
B	$ 360
C	$ 600
D	$ 480
E	$1,800
F	$ 720
G	$ 600
H	$ 480
I	$3,600
J	$ 540

A. Find the **mode** and **median** monthly rents. Show or explain all your work.

Mode: _____

Median: _____

GO TO THE NEXT PAGE TO FINISH THE QUESTION.

27. *Continued*. Please refer to previous page for task explanation.

> **B.** The builder plans to advertise using one statistical measurement that gives a fair representation of the monthly apartment rents. He will use the mean. Find the **mean** (average) rental. Show or explain all your work.
>
> Explain why the **mean** does not fairly represent the monthly apartment rents.